PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)	19 JUL 2005
Applicant's or agent's file reference IVAV-0056	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US05/00612	07 January 2005 (07.01.2005)	09 January 2004 (09.01.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): G06K 9/36, 9/40, 9/46 and US Cl.: 382/248, 275

Applicant

AYSCOUGH VISUALS LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☒ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/00612

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/00612

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 1, 4/1, 5/1, 6/1, 7/1, 8/1, 9/8/1, 10-14, 19, 20, 34, 35, 37

because:

☒ the said international application, or the said claim Nos. 1, 4/1, 5/1, 6/1, 7/1, 8/1, 9/8/1, 10-14, 34, 37 relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 19, 20, 34, 35 are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. ____ are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. ____

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form
- ☐ has not been furnished
- ☐ does not comply with the standard

the computer readable form
- ☐ has not been furnished
- ☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See Supplemental Box for further details.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/00612

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO
Inventive step (IS)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO
Industrial applicability (IA)	Claims Please See Continuation Sheet	YES
	Claims Please See Continuation Sheet	NO

2. Citations and explanations:

Please See Continuation Sheet

Claims 9, 16-18, 23, 36 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the transform decorrelates at least part of the transform data set better in one direction than penpendicular direction, and in which a first algorithm is applied by carrying out a one-dimensional scan in the direction of greatest correlation. Banahm also does not teach convolving the transform data at the location with each of a plurality of third one-dimensional basis functions (); and determining a third basis function of a greatest magnitude; and in which the atom is further derived from the third basis function corresponding to the greatest determined magnitude. Banham also fails to teach convolving the transform data at the location with each of a plurality of second one-dimensional basis functions (); determining a second basis function representative of a greatest magnitude; and including, representing part of the transform data surrounding the location with an atom derived from the first and from the second basis functions corresponding to the greatest determined magnitudes.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/00612

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

V.1. Reasoned Statements:
The opinion as to Novelty was positive (Yes)with respect to claims 9, 16-18, 23, 36
The opinion as to Novelty was negative (No) with respect to claims 2-8, 15, 21-22, 24-33
The opinion as to Inventive Step was positive (Yes)with respect to claims 2-18, 21-33, 36
The opinion as to Inventive Step was negative(NO) with respect to claims NONE
The opinion as to Industrial Applicability was positive (YES) with respect to claims 2-18, 21-33, 36
The opinion as to Industrial Applicability was negative(NO) with respect to claims NONE

V. 2. Citations and Explanations:
Claims 2-8, 15, 21-22, 24-33 lack novelty under PCT Article 33(2) as being anticipated by Banham et al "A Sele ctive Update Approach to Matching Pursuits Video Coding".

With regard to claim 2, 26, 27, 29, and 32, Banhan teaches a method of data compression comprising: a) applying a transform to multi-dimensional data to generate a multi-dimensional transform data set (page 119, column 2, lines 35-37); b) convolving the transform data set with each of a plurality of first one-dimensional basis functions to generate a corresponding plurality of convolved data sets (page 121, column 2, second to the last paragraph); c) determining a location in a first direction across all the convolved data sets, and a first basis function, representative of a greatest magnitude (page 121, last paragraph into page 122, line 7); d) representing part of the transform data surrounding the location with an atom derived from the first and second basis functions corresponding to the greatest determined magnitudes (page 122, column 1, step 1); e) subtracting the atom from the transform data set to create a new data set (page 122, column 1, step 2); f) repeatedly updating the convolved data sets by convolving any changed part of the transform data set with each of the plurality of first one-dimensional basis function, and then re-applying steps (c) and (d) (page 122, column 1, step 3); and g) outputting a transform data coded versions of the atoms derived at step (d) (output from step 3).

With regard to claim 3, Banham teaches that the coded version of each atom includes magnitude, position in transform data set and number of basis function (page 121, column 1 last paragraph-column 2, line 13).

With regard to claim 4, Banham teaches the data to be compressed represents video image data (title).

With regard to claim 5, Banham teaches that the data to be compressed represents a still image (each frame in video).

With regard to claim 7, Banham teaches one dimension of the transform data represents time (figure 2).

With regard to claim 8, Banham teaches the transform is frequency-separating transform (figure 2).

With regard to claim 15, Banham teaches applying a function map to the convolved data sets before determining the location of greatest magnitude (page 122, column 2, line 1-page 123, column 1, line 2).

With regard to claim 21, Banham teaches that the second one-dimensional basis functions extend in the spatial domain (page 122, eq. 6).

With regard to claim 22, Banham teaches that the second one-dimensional basis functions extend in the time domain (figure 1).

With regard to claim 24, Banham teaches that the second basis function representative of the greatest magnitude is determined without further searching in the region of the location (page 122, column 1, lines 7-9).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/00612

Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

With regard to claim 25, Banham teaches that the second basis function representative of the greatest magnitude is determined at least partly by searching a local area in the region of the location (page 123, column 1, lines 3-11).

With regard to claim 28, Banham teaches a method of data compression comprising applying a transform to multidimensional data to generate a multi-dimensional transform data set (figure 1 and page 119, column 2, lines 35-37), and coding the transform data set by applying a one or more one-dimensional matching pursuits algorithm (II. Matching Pursuits for Video Coding).

With regard to claim 30, Banham teaches means for convolving the transform data at the location with each of the plurality of second one-dimensional basis function and means for determining a second basis function representative of a greatest magnitude; and in which the means for representing part of the transform data further operates upon the second basis functions (page 122, column 2, line 1-page 123, column 1, line 2).

With regard to claim 31, Banham teaches a coder for data compression comprising: means for applying a transform to multi-dimensional data to generate a multi-dimensional transform data set (page 119, column 2, lines 35-37); means for convolving the transform data set with each of a plurality of first one-dimensional basis functions to generate a corresponding plurality of convolved data sets (page 121, column 2, second to the last paragraph); means for determining a first location in a first direction across all the convolved data sets, and a first basis function representative of a greatest magnitude (page 121, last paragraph into page 122, line 7); and representing part of the transform data surrounding the first location with a first atom derived from the first function corresponding to the greatest determined magnitude (page 122, column 1, step 1).

With regard to claim 33, Banham teaches a coder (figure 4).